C 23473 **(Pages : 3)** **Name.....**

Reg. No.....

SECOND SEMESTER M.B.A. DEGREE EXAMINATION, JULY 2022

(CUCSS)

M.B.A.

BUS 2C 14—MANAGEMENT SCIENCE

Time : Three Hours Maximum : 36 Weightage

Part A

Answer **all** *questions.*
Each question carries 1 *weightage.*

1. What do you mean by sensitivity analysis ?
2. Identify the significance of game theory.
3. State the merits of CPM.
4. What is slack variable ?
5. What do you mean by an Initial basic feasible solution in a transportation problem ?
6. What do you mean by Expected Monetary Value ?

(6 × 1 = 6 weightage)

Part B

Answer any **four** *questions.*
Each question carries 3 *weightage.*

7. What do you mean by an assignment problem ? Explain how it is different from transportation problem.
8. Solve the game whose pay off matrix is given by :

	Player B		
Player A	15	2	3
	6	5	7
	–7	4	0

Turn over

9. A baking company must produce atleast 200 kgs of a mixture consisting of ingredients X1 and X2 daily. X1 costs Rs. 3 per kg and X2 Rs. 8 per kg. No more than 90 kg of X1 can be used and at least 60 kgs of X2 must be used. Formulate a mathematical model to the problem.

10. What is management science ? Discuss the various applications of management science.

11. Write down the dual of the following problem :

$$\text{Min } Z = 2x_1 + 3x_2$$
$$\text{S.t : } \quad x_1 + x_2 \geq 10$$
$$2x_1 + 3x_2 \geq 24$$
$$x_1, x_2 \geq 0.$$

12. Explain the different methods for finding out Initial feasible solution in transportation problem.

(4 × 3 = 12 weightage)

Part C

Answer any **three** *questions.*
Each question carries 4 weightage.

13. Find the initial solution using Vogel's method to the following transportation problem :

	W1	W2	W3	Supply
X1	2	7	4	5
X2	3	3	1	8
X3	5	4	7	7
X4	1	6	2	14
Demand	7	9	18	

14. Explain the advantages of simulation compared to other models.

15. A project work consist of five major jobs for which five contractors have submitted tenders. The tender amounts quoted in lakhs of rupees are given in the matrix below :

		Job				
		L	M	N	O	P
Contractors	I	8	4	2	6	1
	II	0	9	5	5	4
	III	3	8	9	2	6
	IV	4	3	1	0	3
	V	9	5	8	9	5

Determine the optimum assignment schedule.

16. In bank customers arrive at a rate of 30 per day. Assuming that the inter-arrival time follows an exponential distribution and, the service time distribution is also exponential with an average 36 minutes. Calculate the following :
    (a) Average length of non-empty queue.
    (b) The probability that the queue size exceeds 10.
17. Explain various criteria's used for decision making under uncertainty.

(3 × 4 = 12 weightage)

Part D (Compulsory)

It carries 6 weightage.

18. Assuming that the expected time are normally distributed. Find the critical path and project duration.

Activity	*Days*		
	a	*m*	*b*
1-2	2	5	14
1-3	9	12	15
2-4	5	14	17
3-4	2	5	8
3-5	8	17	20
4-5	6	9	12

(1 × 6 = 6 weightage)